Understanding seabird individual movement patterns to assess vulnerability to bycatch in gillnet fisheries

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Seabird bycatch has been reported in coastal salmon gillnet fisheries in Washington and British Columbia. As is typical for long-lived species with low reproductive output, populations of seabirds are very sensitive to even slight increases in adult mortality. Therefore, fisheries bycatch may surpass the limits of sustainability for seabird populations. Common murres (*Uria aalge*) comprise more than 75% of the reported annual bycatch both in WA and BC. However, there is no information on the provenance of these birds, i.e. whether they migrated from WA, BC or Oregon, where colony attendance may differ by up to two orders of magnitude. The purpose of this work is to assess whether common murres from Tatoosh Island - the largest colony in WA, and the closest to the fisheries- are vulnerable to bycatch and if so, to quantify their vulnerability. I am developing a vulnerability index score based on the degree of spatio-temporal overlap between murres and the fisheries abundance and distribution. Bird locations are derived from radio-telemetry data collected between 1999-2001. To gain insight as to how to best build the index models, I am quantitatively describing individual bird movement to better understand their behavior. How far and how fast do they go? In what direction are they going? Is speed constant over time? How much individual variation is there? And finally, do they travel through fisheries areas, at the right time to be at risk of bycatch? Vulnerability to bycatch will be assessed both for individual birds and fisheries management units. These models will help determine whether mortality in gillnets represents a conservation issue for common murre on Tatoosh Island. More broadly, this study provides tools to assess the vulnerability of organisms to anthropogenic activities.